

What is claimed is:

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1. A method for achieving transient, localized, modulation of vascular structure and/or function, comprising:
- 5 topically administering to a patient in need of said modulation, a sufficient amount of material comprising semi-crystalline poly- β -1 \rightarrow 4 N-acetylglucosamine polymers, wherein the polymers are free of protein, substantially free of other organic contaminants, and substantially free of inorganic contaminants, and wherein said administering induces at
- 10 least one transient, localized physiological response selected from the group consisting of stimulation of endothelin-1 release, vasoconstriction, and reduction in blood flow out of a breached vessel,
- whereby the patient experiences transient, localized modulation of vascular structure and/or function.
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2. The method of claim 1, wherein the physiological response comprises stimulation of endothelin-1 release.
3. The method of claim 2, wherein the endothelin-1 is released from vascular
- 20 endothelial cells.
4. The method of claim 1, wherein the physiological response comprises vasoconstriction.
5. The method of claim 1, wherein the physiological response comprises
- 25 reduction in blood flow out of a breached vessel.
6. The method of claim 1, wherein the poly- β -1 \rightarrow 4 N-acetylglucosamine polymer comprises about 50 to about 150,000 N-acetylglucosamine monosaccharides
- 30 covalently attached in a β -1 \rightarrow 4 conformation, and said polymer has a molecular weight of about 10,000 daltons to about 30 million daltons.
7. The method of claim 6, wherein the poly- β -1 \rightarrow 4 N-acetylglucosamine polymer comprises about 50 to about 50,000 N-acetylglucosamine monosaccharides
- 35 covalently attached in a β -1 \rightarrow 4 conformation, and said polymer has a molecular weight of about 10,000 daltons to about 10 million daltons.
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8. The method of claim 7, wherein the poly- β -1 \rightarrow 4 N-acetylglucosamine polymer comprises about 50 to about 10,000 N-acetylglucosamine monosaccharides covalently attached in a β -1 \rightarrow 4 conformation, and said polymer has a molecular weight of about 10,000 daltons to about 2 million daltons.

9. The method of claim 8, wherein the poly- β -1 \rightarrow 4 N-acetylglucosamine polymer comprises about 50 to about 4,000 N-acetylglucosamine monosaccharides covalently attached in a β -1 \rightarrow 4 conformation, and said polymer has a molecular weight of about 10,000 daltons to about 800,000 daltons.

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10. The method of claim 6, wherein the semi-crystalline poly- β -1 \rightarrow 4 N-acetylglucosamine polymer comprises at least one N-acetylglucosamine monosaccharide that is deacetylated, and wherein at least 40% of said N-acetylglucosamine monosaccharides are acetylated.

11. The method of claim 1, wherein the patient is a human.

12. The method of claim 1, wherein the material is in the form of a gel, sponge, film, membrane, foam, spray, emulsion, suspension, or solution.

13. The method of claim 1, wherein the material is applied directly to a blood vessel.

14. The method of claim 1, wherein the vascular structure is a blood vessel selected from the group consisting of capillary, vein, and artery.

15. The method of claim 14, wherein the blood vessel is a breached blood vessel.

16. The method of claim 15, whereby the patient experiences cessation of bleeding.

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17. The method of claim 1, wherein the extent of the transient, localized modulation of vascular structure and/or function is substantially proportional to the amount of semi-crystalline poly- β -1 \rightarrow 4 N-acetylglucosamine administered.

